H. W. Walrond.

AIR RAID FIRST AID

A SERIES OF 15 IDEAL

HOME CHARTS

Giving full instructions as to Air Raid Precautions, Gas Effects, and Recognition and Treatment of Injuries

EDITOR:

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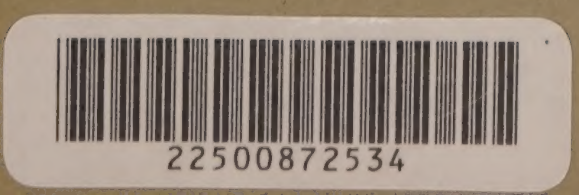

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Formerly Deputy Director of Medical Services of an Army Corps:
Formerly Hon. Surgeon to the Viceroy of India.

BOMBS

Air raiders employ (1) INCENDIARY, (2) HIGH EXPLOSIVE, and (perhaps) (3) GAS BOMBS.

Defending guns use SHRAPNEL of new type.

Most injuries will be wounds or burns, so knowledge of ordinary FIRST AID is of first importance.

Incendiary Bombs

One bomber plane carries 1,000 bombs and can unload them over an area 100 yards by 3 miles in about 60 seconds

Several types, but Light Magnesium (Electron) most effective. Weighs 2 lb. 2 oz. *Composition* :—Thick tube of magnesium alloy filled with thermite (a mixture of iron oxide and aluminium, combustion of which forms molten iron). Igniter either end. Priming ignites tube which burns from 10 to 20 minutes and sets fire to anything inflammable. Penetrates roofs. Does not explode.

Precautions

Keep attics clear of junk. Paint woodwork with flame-resisting paint. Store water in bath, buckets and basins. Keep handy on top floor sand or household ash, a bucket or Redhill container, and long-handled metal scoop and hoe.

How to Deal with Bomb and Resultant Fires

Do not throw water on burning bomb—the effect will be to scatter fragments; but direct, if Home Office pump available, *spray* of water on bomb and extinguishers on surroundings to limit spread of fire. Pick up bomb with scoop, place in bucket half full of sand and cover with ash or sand. Carry outside buildings.

Keep calm and remember any resolute woman, girl or boy can deal successfully with a blazing incendiary bomb.

High Explosive Bombs

Usually 100 to 500 lb. (rarely one-ton bombs have been used).

CONSTRUCTION.—Fuses may be contact fuse which explodes at once, or delayed action percussion fuse permitting bomb to reach basement of building before explosion.

CONTENTS.—(*a*) High Explosive, (*b*) H.E. and Shrapnel.

Anti-aircraft gunners will keep invaders above 12,000 feet so accurate aiming impossible.

EFFECTS.—(*a*) Bombs with contact fuses make funnel-shaped pits like shell holes; (*b*) Delayed action fused bombs destroy surrounding material within radius of 50 to 100 yards. Fragments and shrapnel are projected up to 1,200 yards.

BLAST or PRESSURE is one of the spectacular effects of H.E. bomb.

Suction or Aspiration follows Blast and produces even greater effect.

"Blast" of H.E. bomb falling in narrow street will kill without apparent wound by tearing lungs and rupturing contents of abdomen. Casualties show only oozing from mouth and nose. Ordinary brick buildings "pulled" down. In steel-frame buildings walls affected but floors and upper storeys remain standing. Ferro-concrete most resistant.

Bomb fragments have high velocity and piece size of a pea will comminute long bone.

AVOID CASUALTIES BY.—Remaining indoors on ground floors or basements. Bombs fall obliquely and strike upper storeys.

Anti-Aircraft Shrapnel

Defending gunfire caused many casualties in Great War when curiosity conquered caution. Shrapnel ball now replaced by (*a*) steel rods 2½ in. long; (*b*) metal discs size of a penny.

PREVENTION OF CASUALTIES.—Be cautious. Keep under cover. Avoid curiosity.

Gas Bombs

Shells dropped from aircraft have light casing and explode more readily than shells fired by artillery.

WEATHER AND GAS.—Effects modified by weather as follows:—

1. Calm, mild and/or fog: Slow evaporation. May enter unprotected buildings.
2. Warm: Rapid evaporation and clearance.
3. Cold: Gas remains longer on ground.
4. Frost: Mustard gas may freeze and vaporize in thaw.
5. Rain: Drizzle has little effect but heavy rain clears air and washes off liquid.

Wind: Clears rapidly if wind strong.

Classification

1. According to physical properties. Two Types: (*A*) *Persistent:* Liquids which vaporize slowly and may remain injurious by touch or contact with clothes or boots for weeks. (*B*) *Non-Persistent:* Evaporate rapidly forming clouds. Carried by wind.
2. According to Effects. Four Types: (*a*) Eye Irritants; (*b*) Nose Irritants; (*c*) Lung Irritants; (*d*) General Irritants.

Initials by which gases are known derived from first letters of chemical names, e.g. Chlor-aceto-phenone—C.A.P., except S K. derived from South Kensington Laboratories.

The more you know about gas attacks the less you will fear them.

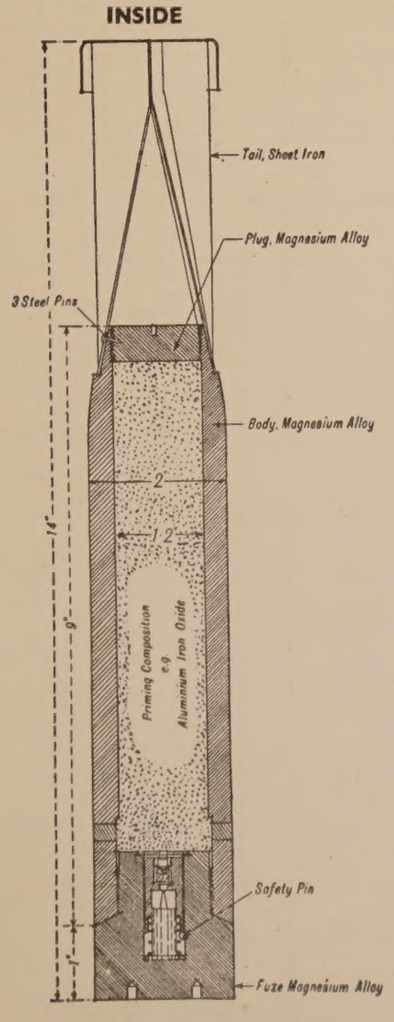
Estimated that 8,200 aeroplanes would be required to gas London.

Respirator (gas mask) protects against all known gases.

"'Gas' is one of the most ancient devices used in fighting. Details are described by Thucydides of the method employed in the Peloponnesian War in the fifth century B.C. After months of siege, faggots impregnated with pitch and sulphur were set on fire outside the city walls. The wind drove on the cloud and rendered one point of the defence untenable. However, a thunderstorm broke, the rain extinguished the fire, and the first gas attack on record was unsuccessful. In 1726 Fleming described in his book, *The Perfect German Soldier*, several new poisons to be incorporated in grenades.

"Chemical warfare fell into disuse for the next hundred years, and the *British Government refused to sanction the use of toxic shells and grenades in the Crimea.*"—*Brit. Med. Journ.*, Oct. 7th, 1939.

INCENDIARY BOMB



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GASES HOW TO RECOGNIZE THEM AND RENDER FIRST AID

Type	Physical Properties	Smell or Special Signs	Effects	First aid in all Three Varieties	Remember by Rhymes
EYE IRRITANTS (Tear gases) Three varieties C.A.P.	Non-Persistent: Grey crystalline solid. Gives off invisible gas.	Laurel or apple blossom.	Copious flow of tears. Spasm of eyelids. Running nose. Slight skin irritation.	Symptoms disappear rapidly on adjusting respirator. C.A.P. bombs are used by police in some countries to disperse mobs. Wash eyes with warm water or a teaspoonful of salt in a pint of hot water. **K.S.K. and B.B.C.** Wash irritated skin with soap and water and apply soft paraffin. Remove contaminated clothing before proceeding to wash eyes with salt solution.	(With acknowledgments to Metropolitan Borough of Marylebone). **TEAR GASES** Tear Gases — first comes C.A.P., Then K.S.K. and B.B.C. If you smell peardrops, then beware, For K.S.K. is in the air. These gases, too, affect the mind, Explain they will not make one blind, Remove and reassure, you "oughter" Bathe your eyes with saline water.
K.S.K. Persists for hours	Persistent: Porter coloured fluid. Gas invisible.	Pear drops smell.	Similar to C.A.P. Liquid affects skin causing irritation. NO DANGER TO LIFE FROM ANY TEAR GAS.		
B.B.C. Persists for days	Persistent: Heavy oily liquid. Yellow colour. Gas invisible.	Penetrating bitter-sweet odour.			
NOSE IRRITANTS (Arsenical smokes, sneezing gases) Three varieties. D.M.	Non-Persistent: Yellow solid.	Faintly fruity.	Appear worse after respirator applied or leaving gas-laden area, but pass off. Do not allow this to engender distrust of gas mask. **Symptoms:** 1. Burning pain in and running from nose and sneezing. 2. Similar pain in gums passing down to throat. 3. Coughing and pain in chest. 4. Headache, nausea and sometimes vomiting. 5. Severe mental depression.	Decontamination of clothing not necessary. Remove outer clothing, shake and hang up in current of air. Wash out eyes and nose. Gargle with bicarbonate of soda (a teaspoonful to the pint). Rest. Fresh air. Combat depression by alcoholic stimulants and firmly assure patient of speedy recovery. NO DANGER TO LIFE. Instead of alcohol a doctor may give whiffs of chloroform which are equally effective.	**NOSE GASES** Nose Gases—D.A., D.C. and D.M., You cannot smell, you cannot see them; This makes it harder still to tell There's arsenic in them as well. They make one sniff and sneeze and blow, They make one very sad and low. Non-persistent, won't endure; Pop on mask and reassure. Be cheerful and remove patient quick; Don't be surprised if she is sick.
D.A. and D.C.	Non-Persistent: White solids. All three are vaporized by explosion into almost invisible cloud of minute particles. All varieties can be generated by heat without explosion, i.e. gas may continue to be given off from bomb casing after explosion.	D.A. has aromatic smell. D.C. smells of bitter almonds. All three may form faint cloud. Do not rely on smelling these odours.			
LUNG IRRITANTS (Choking gases) CHLORINE	Non-Persistent: Pale greenish gas Dissolves in water. Rots fabrics.	Smell of chloride of lime (Bleaching powder)	**Early:** Smarting eyes, cough, retching, vomiting and sense of suffocation. Sometimes blueness of face and lips, palpitation and breathlessness. **Delayed:** Symptoms may be delayed for hours or abate for 2 or 3 hours and then recur. **Late:** Dyspnoea increases, violent coughing, with marked watery spit. Face flushed with bounding pulse, or pallid with lilac lips and weak thready pulse.	**ALL CHOKING GASES** **Treatment** 1. Recumbent position imperative. **All** are stretcher cases. 2. Loosen tight clothing. 3. Remove to fresh air. 4. Complete rest; avoid slightest exertion. 5. Combat shock with hot bottles and blankets. 6. **No** alcoholic stimulants. 7. Hospital as soon as possible for oxygen and air by Haldane, or other oxygen apparatus. 8. **Artificial respiration dangerous.**	**CHOKING GASES** Phosgene and Chlorine are, alas! Chloropicrin, too, a deadly gas, Affects the lungs, affects the breath, And very soon may lead to death. The only hope is perfect rest; Remember this and do your best. Pop on a mask and quickly fetch her, Without the least delay, a stretcher. Don't let her move, give her beef-tea, Keep her as warm as she can be. Don't give her alcoholic drinks; Persuade her to have "forty winks," And in spite of great temptation Don't try artificial respiration.
PHOSGENE	Non-Persistent: Almost invisible gas. Destroyed by rain or water. Corrodes metals.	Phosgene smells of musty hay.			
CHLOROPICRIN	Semi-Persistent: Yellow fluid with pungent odour.	Sweetish smell of chlorine character.	Similar to chlorine. Frequent exposure to small doses may induce liability to nocturnal asthma.		
GENERAL IRRITANTS (Blister gases) MUSTARD GAS German "Yellow Cross," French "Yperite."	Persistent: Oily liquid. Colour straw yellow to dark brown; slightly irridescent. Looks like spilt paraffin on wet road. Vaporizes slowly. Freely soluble in animal oils, thus finding easy entry into skin. Readily absorbed by tar on roads. Splashes may persist for three weeks.	Mustard gas may resemble garlic or onions, but smell varies with material on which it lies. Nose soon fails to distinguish. No immediate skin irritation. Exposure for appreciable period may occur without notice.	Both Mustard Gas and Lewisite Possess Powerful Penetrative Properties **MUSTARD GAS** **Liquid.** Immediately irritates eye but takes a couple of hours to affect skin. Blisters in 12 to 24 hours. **Gas.** No irritation at first unless concentration high. **Eyes.** Later soreness, profuse tears. Spasm of lids. **Air Passages.** No irritation at first. Later hard ringing brassy cough and loss of voice. Bronchitis may supervene. **Skin.** No immediate irritation. Moist surfaces such as armpits, inner surface of thighs and genitals affected later. Redness, itching and blisters appear. **Digestive Tract.** Stomach and intestines may be injured by swallowing food contaminated by gas.	**MUSTARD GAS** **Speed is essence of Treatment.** **Hurry up!** **Liquid. (In Eye.)** 1. Irrigate with undine for 10 minutes. 2. Instil drop of liquid paraffin. 3. Smear lids with soft paraffin. 4. Eye shade. 5. Send to Hospital quickly. **(On Body or Clothing.)** 1. Remove clothing at earliest possible moment. 2. Within five minutes rub in gently for two minutes bleach ointment, i.e. 2 parts chloride of lime and 1 of soft paraffin for small areas; or bleach cream, i.e. equal parts chloride of lime (bleaching powder) and water for larger splashes. Do **not** use these preparations on reddened or blistered parts. 3. Wash body with soap and water.	**BLISTER GAS** When you have heard the warning sound That Mustard Gas is on the ground, Put on the mask that you possess; All helpers have protective dress. Remember, 'tis persistent gas. Will last for weeks on roads or grass. The smallest splash upon your hand Will quickly to a sore expand. If on a person there's a trace, Rush him to the appointed place Take off his boots and clothes and suit And scrub him well from head to foot, Then in another room he'll find Fresh clothes and boots, assistance kind.
LEWISITE American "Dew of Death."	Persistent: Colourless fluid like glycerine. Darkens on exposure to air.	Lewisite has pungent sickening smell of geraniums. Nose rapidly recognizes presence.	**LEWISITE** **Liquid.** Immediate irritation of eyes which may be permanently injured. Immediate stinging of skin with quicker reddening and blistering than Mustard Gas. **Gas.** Acute irritation of nose compels wearing of gas mask or rapid retreat. Skin effects less than Mustard Gas but more dangerous as blister fluid contains arsenic.	**LEWISITE** 1. Liquid contamination in Eye requires irrigation very soon or eye will be damaged. 2. Remove clothing as soon as possible. 3. Water or alkaline solution removes rapidly. No "bleach" compounds necessary. 4. Wash with soap and water or plain water if no soap available.	

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Formerly Deputy Director of Medical Services of an Army Corps;
Formerly Hon. Surgeon to the Viceroy of India.

ASPHYXIA

i.e. Conditions arising from Suspended Breathing

CAUSES

1. Obstruction of air passage.
   (*a*) Drowning.
   (*b*) Pressure from outside, e.g. hanging, smothering.
   (*c*) Foreign body in throat, choking.
   (*d*) Swelling of throat, e.g. inflammation, scald, corrosive poison.
2. Suffocation from inhaling smoke or poisonous gases.
3. Nervous affections, electric shock, narcotic poisons.
4. Pressure on chest, crush in crowd or being buried in earth or debris.

Rules for all Forms of Suspended Breathing

1. Send for doctor.
2. Do not assume death because signs of life absent.
3. Apply general treatment of insensibility.
4. Remove obstruction to breathing.
5. Restore breathing by artificial respiration.
6. Restore warmth and circulation of blood.

I.—Obstruction of Air Passages

(*a*) Drowning.

Death from immersion in water may be caused by (1) suffocation or (2) exhaustion, (3) shock, (4) sudden heart failure, (5) heart disease. Therefore strong swimmers often sink on falling into water without attempting to save themselves. Restoration to life by artificial respiration has occurred when persons have been immersed for as long as fifteen minutes.

Treatment.—(1) Send to nearest house for blankets, clothing, hot-water bottles, hot tea, hot coffee and stimulants.

(2) Send for ambulance or taxi-cab. (3) Send for doctor.

(4) Perform artificial respiration until doctor pronounces person dead, as patients have recovered after two or more hours.

(5) When breathing recommences, but not till then, proceed to carry out Rule 6, i.e. restore warmth and circulation of blood, by means of hot water, hot blankets, hot drinks and stimulants.

(*b*) Pressure from Outside.

Special Treatment for Hanging.

(1) Call for help, but do not wait for it. (2) Grasp lower part of patient. (3) Raise sufficiently to take weight of body off rope. (4) Get helper to cut rope, or release one hand and do it yourself. (5) Support body when rope is cut to prevent injury by falling to the ground. (6) Remove rope from neck. (7) Loosen clothing. (8) Artificial respiration.

(*c*) Foreign Body in Throat.

(1) When bone or anything which obstructs windpipe is swallowed, open mouth, pass two fingers to the back of throat and try to get out article, or if this is impossible, push back into gullet. If vomiting occurs, place head well forward and thump back between shoulder blades.

(*d*) Swelling of Throat Tissues.

Scald of Throat.—Not infrequent from children drinking water from spout of kettle of boiling water.

Treatment.—(1) Sit in chair before fire. (2) Apply flannel or sponge wrung out of warm water to front of throat. (3) Give sips of cold water or dessertspoonful salad oil. (4) Artificial respiration.

II.—Suffocation from Inhaling Smoke or Poisonous Gases

FUMES, e.g. Sewer, Coal and Water Gases. Coke and Charcoal Fumes

To Rescue:—

(1) Tie handkerchief, folded as triangular bandage, soaked in water or one part vinegar in four parts water over face. Bottom edge across bridge of nose, point hanging down over mouth and nose. (2) Take few good deep breaths. (3) Bend low, except gas heavier than air, and run to patient's side. (4) Carry out by fireman's lift. (5) Artificial respiration

III.—(*a*) Nervous Affections as result of Poisons

(See Chart of Poisoning)

(*b*) Electric Shock may produce—

(1) Severe shock. (2) Insensibility. (3) Death.

Patient unable to move from contact as current paralyses him.

Treatment.—(*a*) Switch off electric current if possible. (*b*) Get sufferer away from wire. First aider runs great risk of being himself affected by current. He must insulate himself from current by touching patient with substance through which electricity cannot readily pass, e.g. dry wood, india-rubber articles, dry glass, dry straw, dry cloth.

Common metals—iron, copper, brass, and also water allow electricity to pass freely. Damp clothing must be avoided.

Proceed as follows:—

(1) Shove patient away from contact by means of dry pole; or

(2) Push away with sleeve of dry coat, or empty india-rubber tobacco pouch used as glove; or

(3) Throw dry coat held by sleeves, or a dry belt, over head or round body, and drag victim away from contact.

(4) After rescuing patient, carry out general treatment for insensibility.

(5) Perform artificial respiration if breathing has ceased.

(6) Treat shock, dress burns.

Artificial Respiration

Artificial Respiration is Imitation of Natural Breathing

There are five methods, viz.: (1) Howard's, consisting of compression of ribs with arms raised. Patient supine, pad middle of back, operator kneels across hips. Indicated in injury of arms. (2) Marshall Hall's, consisting of compression of ribs and rolling to right side. Requires two assistants. Patient prone, pad beneath chest, operator kneels left side.

Carbon Dioxide, CO_2

All authorities (Red Cross, St. John and R.A.M.C.) recommend CO_2 (Carbonic acid gas; Carbon Dioxide) as a powerful stimulant in respiration.

CO_2 Resuscitators should be available at First Aid posts and instantly applied to mouth and nose through inhaler if possible.

In asphyxia the gas can only be drawn into the lungs whilst artificial respiration is being performed. Supply CO_2 for three minutes, wait three minutes and give again unless mixture with oxygen is available which can be given until breathing is established.

METHOD AND WHEN RECOMMENDED

	Schafer. Easily applied by one person.	Silvester. In drowning and where congestion of face.	Laborde. When ribs are broken, and children.
1. Clothing of patient	Waste no time removing clothing.	Remove clothing, ensure absolute freedom of patient's neck, chest and waist.	Remove clothing.
2. Position of patient	Prone, i.e. back upwards.	Patient flat on his back with a pad placed under shoulder blades.	On back or side.
3. Position of operator	Kneel astride facing patient's head.	Kneel behind patient's head.	Kneel at side of patient.
4. Attention to air passages	Clear mouth and nostrils of any obstructing material.	Open and wipe mouth and lips.	Clean mouth.
5. Movements of operator	Place palms of hands on small of back of patient. Draw forward slowly, apply firm pressure straight downwards upon back and lower part of chest. (This excites expiration.) Draw your body back and relax pressure, but do not remove hands. (This induces inspiration.) Repeat 12 times a minute. Pressure 2 seconds. Relaxation 3 seconds.	Draw out tongue, grasp patient's forearms just below elbow, draw arms upwards, outwards, towards you with a sweeping movement, making the elbows touch the ground. (This draws air into the lungs.) Bring patient's flexed arms slowly forward, downwards, and inwards, pressing the arms and elbow firmly on chest. (This drives air out of the chest.)	Seize patient's tongue with a handkerchief and pull it forward. Hold it thus for two seconds, then allow it to recede into the mouth.
6. Auxiliary efforts	Carbon dioxide, smelling salts, flick chest with towel, keep patient warm.	Same as for Schafer's method.	Same as for Schafer's method.

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FRACTURES, DISLOCATIONS AND SPRAINS

Fractures are simply broken bones classified according to (*a*) condition of surrounding tissues, viz.:—

1. Simple, when skin is not injured.
2. Compound, when accompanied by wound, caused either by force which produced fracture or by ends of broken bone protruding through skin.
3. Complicated, bone broken with injury to internal organ, blood-vessel, or nerve.

(*b*) injury to bone, viz.:—

Comminuted—broken in several places.

2. Greenstick—bent and cracked without breaking across (children).
3. Impacted—ends of broken bone driven into each other.

Causes

1. Direct violence, blow, crush or bullet.

2. Indirect violence—through indirect transmission of force applied, e.g. collar-bone by fall upon the out-stretched hand; base of the skull by fall from height upon feet.

3. Muscular action—i.e. sudden and violent action of muscle, e.g. knee-cap in jumping.

SIGNS AND SYMPTOMS OF FRACTURES

1. Pain.—At or near broken part.
2. Loss of Power.—Limb cannot be put to proper use: e.g. leg broken, cannot stand; arm broken, hand cannot be raised to back of head.
3. Deformity.—Limb bent, twisted or shortened by contraction of muscles, causing over-riding of fragments.
4. Swelling.—Due to contraction of muscles and effusion of blood.
5. Irregularity of Bone.—Break may be felt if near surface, e.g. clavicle may be both seen and felt.
6. Unnatural Mobility.—When limb gives way where, if sound, it would not be moveable.
7. Crepitus.—Grating sensation, caused by broken ends of bone grating against one another. *First-aider must on no account try to obtain last two signs lest injury be aggravated.* Both absent in greenstick and impacted fractures.

GENERAL MEANS OF TREATMENT

1. Send for doctor.
2. Do not move patient until treated.
3. Stop bleeding first, apply splints afterwards.
4. Prevent further injury by steadying and supporting limb.
5. Reduce shock by keeping warm.
6. Without using force place limb in natural position if possible, and apply improvised splints.
7. If backbone, pelvis or thigh injured, keep patient lying down.
8. If in doubt, treat as fracture.

Splints.—Splints may be improvised from walking-sticks, umbrellas, broom handles, pieces of wood, bundles of twigs, folded newspapers, cardboard or rolled up maps. Splints should be (1) padded, (2) of ample width, and (3) applied over clothes.

Bandages.—Triangular used for first aid purposes as it may be improvised from handkerchiefs, table napkins or strips of any material. Broad for trunk, narrow elsewhere; tie off *over* splint.

Fix joints above and below fracture with splints. Do not apply splint over wound.

First aid splinting of fractures of Forearm, Leg and Thigh are illustrated on Chart 11.

CRUSHED FOOT

1. Rip up boot, cut off sock. 2. Figure-of-8 bandage. 3. Well-padded splint. 4. Elevate foot. (Chart 11.)

CRUSHED HAND

1. Well-padded splint from above wrist to beyond tips of fingers. 2. Figure-of-8 bandage. 3. Large arm sling. (Chart 11 I.)

DISLOCATIONS

Displacement of one or more bones at joint. Signs and Symptoms:—

1. Pain of sickening character in and around joint.
2. Deformity, i.e. change in shape of joint.
3. Swelling.
4. Fixity of Joint.—All usual movements impossible.
5. Loss of Power and lengthening or shortening of limb.
6. Numbness below affected joint.

Treatment.

(*a*) *Out of doors.*—Support limb in comfortable position.

(*b*) *Indoors.*—1. Send for doctor. 2. Remove clothing and place in bed. 3. Place limb on pillow and apply ice or cold water dressing. 4. If cold fails to give relief, apply hot fomentations. 5. Avoid shock by keeping patient warm.

SPRAINS OF JOINTS

Injury of joint involving tearing or stretching of ligaments. Signs and Symptoms:—

1. Pain after wrench or twist.
2. Loss of Power.
3. Swelling or Discoloration.

Sprained ankle is commonest Sprain.

Treatment.

(*a*) *Out of doors.*—1. Don't remove boot or shoe. 2. Apply tight bandage over boot beginning at sole, crossing in front of ankle and passing several times round ankle. 3. Wet bandage after application.

(*b*) *Indoors.*—1. Remove boot as in crushed foot. 2. Place in comfortable position. 3. Apply cold water bandages. If these fail to give relief, use hot fomentations. 4. Do not allow walking till seen by surgeon.

STRAINS

Overstretching of muscle or tendon. Ruptured muscle—tearing of muscle fibres. Signs and Symptoms:—

1. Pain. 2. Swelling. 3. Loss of Power.

Treatment.

1. Limb in a comfortable position, bed if necessary. 2. Hot applications or water bottles.

So-called "strain in groin" is rupture.

Special Fractures	Special Signs.	Special Treatment.
Clavicle ..	1. Irregularity felt. 2. Arm on injured side supported by hand. 3. Head inclined towards injury.	1. Remove coat. 2. Pad 2 inches thick in armpit. 3. St. John sling. 4. Broad bandage round elbow and trunk. (Chart 11.)
Cranium (upper part)	1. Swelling. 2. Irregularity. 3. Insensibility (concussion or compression). (*See* Insensibility.)	Treat as concussion and compression. (Chart 7.)
Cranium (base) ..	1. Insensibility. 2. Bleeding from ear, nose, or into orbit, causing bloodshot eye, or stomach, causing black vomit.	Ditto.
Jaw	1. Inability to speak. 2. Irregularity of teeth. 3. Bleeding of gums.	1. Keep mouth clean. 2. Apply narrow bandage under chin and over head.
Patella ..	1. Irregularity, gap may be felt. 2. Knee swollen, fixed and helpless.	1. Semi-recumbent position. 2. Raise heel well above ground. 3. Special bandage over and below knee-cap. (Chart 11 G.)
Pelvis ..	1. No sign of injury to limbs, but patient cannot stand or move limbs without pain. 2. Bloody urine if bladder injured.	1. Make patient comfortable. 2. Apply broad bandage. 3. Treat as spine.
Ribs—6, 7, 8, or 9 ..	1. Pain on deep breath. 2. Short, shallow breathing. 3. Lung or liver, R. side, or spleen, L., may be injured. Result—(*a*) lung, frothy blood coughed up; (*b*) lung, spleen, or liver, internal hæmorrhage.	1. *No injury to lungs, &c.*—Two broad bandages or towel. 2. Large arm sling injured side. *Lungs injured.*—1. No bandage. 2. Recumbent posture, incline to injured side. 3. Loosen clothing. 4. Give ice. 5. Large arm sling. 6. Treat as internal hæmorrhage.
Scapula ..	1. Irregularity felt. 2. Elbow supported, and head turned as in fractured clavicle.	1. Broad bandage. Armpit to uninjured shoulder. Cross and tie in uninjured armpit. 2. St John sling for injured limb.
Spine ..	1. Pain at fracture. 2. Loss of power and sensation in legs and even arms.	1. Prevent movement. 2. Treat shock. 3. *Transport.*—(*a*) If unconscious face upwards. (*b*) If conscious but unable to move arms or legs suspect broken neck, and remove face upwards. Prevent movement of head and neck by three pads 4 inches thick placed under the chin and on each side of the neck. If conscious and only one or both legs paralysed, suspect broken back and remove face downwards.
Sternum	As fractured rib.	Undo clothing, keep quiet in easy position.

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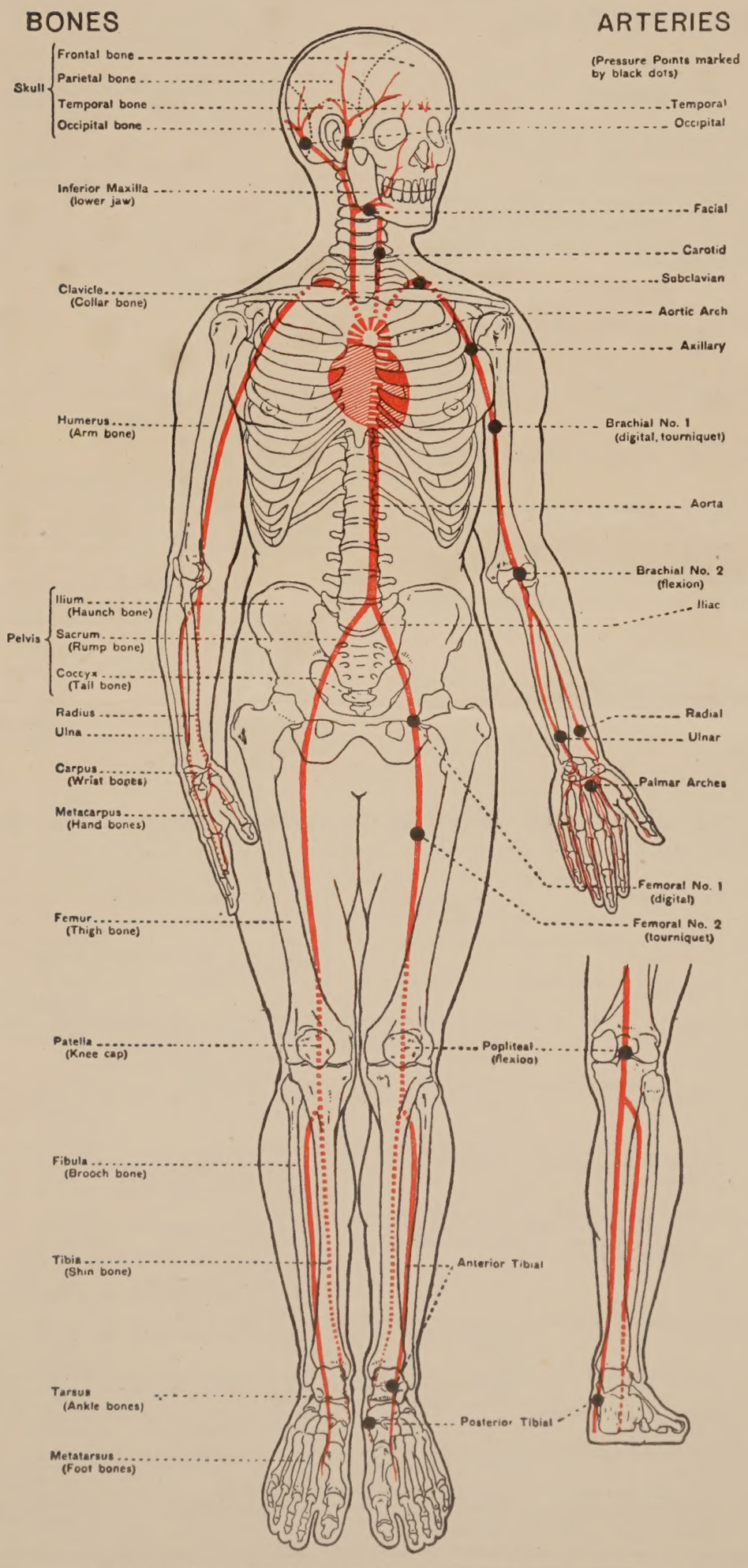

HUMAN BODY SHOWING ARTERIES AND PRESSURE POINTS

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HÆMORRHAGE

i.e.

BLEEDING

Three varieties, viz. : (1) Arterial, (2) Venous, (3) Capillary. First usually most serious. In all cases of Arterial bleeding—

Send written message for Doctor.

ARTERIAL bleeding is (*a*) scarlet, (*b*) escapes from wound in spurts, (*c*) issues from side of wound nearer heart. VENOUS bleeding is (*a*) dark red, (*b*) flows in continuous stream, (*c*) from side further from heart. CAPILLARY bleeding is (*a*) bright red, and (*b*) oozes, flows briskly, or (*c*) wells up from all parts of wound.

Rules for arresting Arterial hæmorrhage (every injury except cut throat) :—

A. Position.

1. Lay patient down. Bleeding less sitting, still less recumbent.
2. Raise bleeding limb if not fractured.

B. Nature's Means, i.e. Clotting.

Clotting plugs end of artery ; encourage by rest, ice and cold water.

C. Pressure.

1. Remove as little clothing as possible to expose wound.
2. Apply pressure with finger or thumb whilst pad prepared.
3. Place pad over bleeding point and bandage firmly.
4. If bleeding persists place pad over joint *above* wound and forcibly flex joint. Fix flexed.
5. If this fails compress pressure point by fingers or thumb and apply tourniquet.

TOURNIQUETS

Surgical appliances for controlling hæmorrhage by compressing artery and preventing passage of blood through it. Sites for applying :—

(*a*) Half-way between elbow and armpit.

(*b*) Middle of thigh.

Useless on leg or forearm.

Five varieties described in B.R.C.S. Manual not including St. John type, but readily improvised as follows :—

(i) Place firm pad on pressure point.
(ii) Encircle limb by folded handkerchief with centre over pad. Tie ends in half knot.
(iii) Place pencil, stout twig or pipe stem on half knot and tie off.
(iv) Twist pencil to tighten bandage and press pad against artery.
(v) Secure ends of handkerchief or apply narrow bandage.

Do not leave a tourniquet on for more than half an hour without examination or it may cause mortification.

INTERNAL HÆMORRHAGE

From an internal organ caused by injury, stab, bullet or disease.

Signs are :

1. Weakness.
2. Fainting and giddiness.
3. Laboured and hurried breathing.
4. Patient yawns and sighs.
5. Pulse fails and pallor of face and lips.
6. Cold clammy sweat.
7. Patient complains of being suffocated, gasps for air and may become unconscious.

Treatment whilst removing to Hospital :—

1. Allay anxiety and avoid conversation.
2. Keep patient quiet and lying down.
3. Loosen tight clothing.
4. Fresh air.
5. Give cold water to sip or small pieces of ice to suck.
6. Do not give stimulants.
7. Bandage limbs from toes to hips and fingers to shoulders.

Most serious forms of Venous bleeding are (*a*) burst varicose veins, (*b*) cut throat (when jugular veins wounded).

(*a*) **Varicose Veins.** *Treatment* :—

1. Lay patient down.
2. Raise leg.
3. Remove clothing.
4. Apply pressure with thumb.
6. Dress with pad and bandage.

If bleeding continues apply narrow fold bandage above the bleeding and another below. These two bandages can be removed in fifteen minutes. (Chart 10 I.)

(*b*) **Cut Throat.**—Pressure on wound by relays of intelligent assistants. If large vessels of throat divided death occurs, but this is uncommon. Most cases require general treatment for incised wound. If windpipe divided and patient breathing through wound, dress only ends of wound till doctor arrives.

BLEEDING FROM NOSE

TREATMENT.

1. Seat patient in chair in open or before open window with head slightly thrown back.
2. Raise hands above head and give to assistant to hold.
3. Undo all tight clothing around neck and chest.
4. Apply sponge or pad soaked in cold water, or piece of ice over nose and also at nape of neck.
5. Instruct patient to keep mouth open, to avoid breathing through nose and *not* to blow it.
6. Compress nostrils between finger and thumb as far back as possible.
7. For sudden nose bleeding in *elderly* person place in recumbent position and send for doctor.

Arrest of Arterial Bleeding in various parts of the Body

PRESSURE POINT.—A point on surface of limb over which pressure stops or slows flow of blood in artery. (Chart 5.)

Part wounded and artery involved.	Pressure point.	Direction of pressure.	Method of applying pressure.	Mode of applying bandage.
1. HEAD (FRONT OR TOP) (TEMPORAL)	In front of the lappet guarding opening of ear.	Directly against bone.	(i) Thumb. (ii) Pad placed on artery and fixed by triangular bandage.	Narrow-fold bandage twisted to maintain firm pressure. Ring pad if fracture.
2. HEAD (BACK OF) (OCCIPITAL)	Three fingers' breadth behind back of ear.	Ditto.	Ditto.	Centre of narrow-fold bandage on pad, cross on forehead and knot off on pad. Ring pad if fracture.
3. NECK (CUT THROAT) (CAROTID)	Hollow just on outer side of Adam's apple.	Backwards and inwards against backbone. Pressure on the windpipe must be carefully avoided.	With the thumb, to be maintained by relays of capable assistants. Bend the head forward upon the chest and fix it in this position by means of bandages and pillows.	Maintain pressure till doctor arrives. *Do not apply a bandage.*
4. ARMPIT (AXILLARY) ..	Hollow just above and behind centre of collar-bone.	Downwards and backwards against the upper surface of first rib.	With the thumb at first, then with the handle of a door-key padded. (Chart 10.)	Place pad in armpit and keep in position with a narrow bandage crossed over the shoulder and knotted off under opposite armpit. Fix by broad bandage at elbow level. (Chart 10 E.)
5 ARM ABOVE ELBOW (BRACHIAL)	Hollow just below biceps (and above triceps) muscle—limb extended, palm up.	Outwards and backwards against the arm bone.	(i) Stand behind patient. (ii) Grasp arm, pressing tips of fingers along inner side of biceps muscle. (iii) Rotate arm outwards and backwards.	Place a firm pad over the line of the brachial artery and keep in position with narrow bandage. Place forearm in a large sling.
6. FOREARM (RADIAL OR ULNAR)..	(i) Bend of the elbow for brachial artery, of which both radial and ulnar are branches. (ii) Radial and ulnar.	(i) Downwards and backwards against the bone. (ii) Directly backwards.	*Brachial.* (i) Apply pad made from folded handkerchief to bend of elbow. (ii) Flex forearm firmly on the arm. *Radial and Ulnar.* (i) Cut cork in two lengthwise. (ii) Place one half on radial and one on ulnar.	(i) Pass a narrow bandage or belt round forearm close to wrists and carry ends just below the armpit. Bring ends forward again crossing between forearm and arm and tie off over wrist. (Chart 10.) (ii) Tight narrow bandage.
7. HAND (PALM OF) (PALMAR ARCHES)	Half an inch above wrist on each side.	Elevate the arm and press directly backwards against the wrist bones.	With the fingers at first, afterwards with firm pad, lightly grasped by patient.	Place rolled up handkerchief in the palm, bend fingers over it and apply bandage firmly. If bleeding continues, proceed as for bleeding from forearm.
8. THIGH (HIGH UP) (FEMORAL)	Just below fold of groin.	Bend knee and turn thigh outwards and then press outwards towards the thigh bone.	With both thumbs, one upon the other ; keep up pressure by relays of trained helpers.	Bandage should not be applied, but pressure maintained till doctor arrives. Don't waste time removing trousers.
9. HAM (FEMORAL)	Junction of upper and middle part of thigh.	Ditto.	With both thumbs, one upon other, then use tourniquet.	St. John or improvised tourniquet. (Chart 10.)
10. LEG (POPLITEAL) ..	Centre of back of knee-joint.	Directly backwards against the bone as much as possible.	Pad as large as tennis ball behind the knee. Bend knee until heel almost touches the hip.	Carry narrow bandage round leg just above ankle and tie round thigh as close to groin as possible.
11 FOOT (i) (PLANTAR) (ii) (DORSAL ARTERY OF FOOT)	(i) In hollow behind prominence of inner ankle. (ii) Over centre of the ankle in front	Raise legs, press forwards and outwards against the bone for (i) and directly backwards against the bone for (ii).	Apply pad on each pressure point and fix with narrow bandage.	Apply centre of narrow bandage to sole of foot, cross over the pads, carry round the ankle and tie off over pads.

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INSENSIBILITY

i.e. UNCONSCIOUSNESS

General Rules for Treating Insensibility

1. Send written message for doctor.

2. If breathing cannot be detected perform artificial respiration and treat obstruction to air passages or gas poisoning (see Asphyxia, Poisoning and War Gases).

3. If breathing:
   (*a*) Face pale, raise feet, lower head and shoulders.
   (*b*) Face flushed, raise head and shoulders.

4. Stop bleeding, if present; examine patient for fracture or dislocation before moving; examine surroundings for clues to injury. If spine or bone fractured, steady and support.

5. Loosen clothing of chest and abdomen. Give plenty of fresh air, cover warmly.

6. Give nothing by mouth.

7. Carry out appropriate special treatment.

8. Protect patient from rain or sun. If medical help unavailable in, say, half an hour remove to shelter.

9. Do not leave unattended. Do not presume patient is drunk because he smells of alcohol.

10. When consciousness returns give sips of water, or if pulse weak, and hæmorrhage not suspected, hot tea or coffee. Except in poisoning encourage sleep.

Effects of Heat, Severe Injuries, Alcohol and Poisons

	Sun-stroke.	*Heat Exhaustion.*	*Shock.*	*Collapse.*
CAUSE ..	Exposure to direct rays of sun	Prolonged exposure to high temperature, *plus* physical exertion	Hæmorrhage, Severe injuries, e.g. broken bones burns, &c.	Alcohol and poisons Prolonged anæmia of brain causes unbalanced circulation
ONSET	Sudden	Gradual	Gradual	Gradual
APPEARANCE OF PATIENT	Unconscious; flushed face	Slightly unconscious	Partial insensibility; face pale	Insensibility varies with amount of alcohol or poison taken
EYES	Blood-shot; pupils usually contracted	Dull-looking	Sunken; pupils dilated	Pupils dilated in Alcohol Pupils contracted in Opium
BREATHING ..	Quick and noisy	Quiet and easy	Very quiet	Slow, but snoring in character
PULSE ..	Quick, strong and jumpy	Quick but feeble	Very weak	Very weak
SKIN	Very hot and dry; high fever	Pale and cool	Cold and moist	Cold and moist
MUSCLES ..	Trembling, often rigid	At rest	At rest	Quite slack
SPECIAL TREATMENT	Remove to cool place, strip to waist	Remove to bed, cover warmly	Cover up warmly	Cover up warmly
GENERAL TREATMENT	Pour cold water on head, wrap in sheets wrung out in cold or preferably iced water; fan vigorously	When consciousness returns give stimulants Hot bath	Raise foot of bed, and apply hot water bottles Give hot coffee with plenty of sugar in it, but no alcohol except under medical orders	Remove indoors rapidly Keep quiet

THE VARIOUS KINDS OF INSENSIBILITY, THE MEANS OF RECOGNIZING THEM AND THEIR TREATMENT

	HEAD INJURIES.		FITS.				
	Concussion of Brain.	*Compression of Brain.*	*Epilepsy.*	*Apoplexy.*	*Hysteria.*	*Fainting.*	*Infantile Convulsions.*
CAUSE ..	Blows or falls on head. Skull usually shows no sign of injury.	Injury to head. Skull often shows signs of injury.	Hereditary predisposition. Often history of previous attacks.	Diseased blood-vessel bursting in the brain.	People with very nervous temperaments exposed to mental and physical strain. Excessive joy and sorrow.	Hunger, extreme fatigue. Warm, close, or crowded rooms. Loss of blood. Sudden emotion. Pain.	Teething, bowel troubles and onset of serious illness.
ONSET ..	Sudden.	Gradual and progressive.	Sudden and usually without warning.	Sudden.	Gradual.	Sudden.	Gradual or sudden.
APPEARANCE OF PATIENT	Unconscious, but can often be roused by shouting.	Deep unconsciousness—Cannot be roused.	Unconscious. Tongue bitten. Bloody froth from mouth.	Deep unconsciousness—Cannot be roused. (Middle-aged or older.)	Jerky movements of body; patient can be roused to consciousness.	Unconscious; very pale face and white lips.	Unconscious; cannot be roused. Face pale at first then blue.
EYES ..	Pupils equal in size and get smaller when exposed to light.	Pupils unequal in size and do *not* alter with exposure to light.	Fixed insensitive. Eyelids easily raised.	Pupils unequal in size—and do *not* alter with exposure to light.	Eyelids firmly closed and patient resists opening them.	Fixed; insensitive if unconsciousness complete.	Eyelids closed or eyes squinting.
BREATHING ..	Slow and feeble—often hardly perceptible.	Slow, but snoring in character.	At first almost stops, then loud.	Slow, but snoring in character.	Quick and noisy.	Quick but silent.	Very quick or interrupted "breath held." Frothing at mouth.
PULSE ..	Slow and weak.	Slow and strong.	Quick.	Slow and strong.	Quick, but normal.	Quick and weak.	Quick but weak.
SKIN ..	Cool.	Hot.	No change.	Hot.	No change.	Cold sweat on forehead and palms of hands.	Cold and wet with perspiration.
MUSCLES ..	Lifeless and soft.	One side of body quite limp.	Stiff at first, then soft.	One side of body quite limp.	Voluntary stiffening of muscles.	Slight jerking of muscles.	Stiff. Face muscles twitch.
SPECIAL TREATMENT	Head and shoulders low, absolute rest, warmth to body and limbs.	Dress wound, if present, with ring pad.	Place patient so that he cannot injure himself.	Head and shoulders raised, apply cold to head.	Cold douche to head, flick face and neck with corner of a wet handkerchief. Keep away sympathetic friends.	Lay flat on back with head and shoulders low.	Support in hot bath to about waist for 15–20 minutes and apply cold water to head.
GENERAL TREATMENT	Avoid stimulants and keep quiet. Protect from all mental and physical strain.	Warmth to body. Hot-water bottles to feet, mustard poultices to calves of legs.	Place well-padded piece of wood or comb between teeth. After fit encourage natural sleep.	Warmth to body. Hot-water bottles to feet, mustard poultices to calves of legs.	If fit severe or prolonged, treat as if Insensible. Mustard leaf to back of neck.	Smelling-salts or weak ammonia to smell. Give a teaspoonful of sal volatile in a large wineglassful of water to drink.	After bath place child in bed and keep warm.

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POISONING

A poison is a substance which, when taken into mouth or stomach or when absorbed into blood, is capable of seriously affecting health or destroying life.

Poisoning may be suspected by (1) sudden appearance of alarming symptoms in person in good health, (2) onset of symptoms soon after food or drink has been taken.

Occasionally apparently sound food may cause signs of poisoning in some persons who have consumed it and not in others. Unsound food may produce condition known as ptomaine poisoning and not infrequently cause death.

When called to render First Aid in case of suspected poisoning, 1. Take quick glance round room or vicinity, to endeavour to detect a bottle denoting poison which has been swallowed. 2. Throw nothing away. 3. Carefully note any stains, burns on the mouth or the clothes. These are usually present when corrosive poisons have been taken; and modify the treatment. 4. Note odour of breath, which will be important in carbolic acid, prussic acid, opium and alcoholic poisoning. 5. Note presence or absence of drowsiness. 6. Observe state of pupils, which are dilated in belladonna and alcoholic poisoning and contracted in opium poisoning.

GENERAL TREATMENT OF POISONS

First-aid treatment of poisons is: 1. Send for medical help, informing doctor of poison suspected. 2. Artificial respiration when breathing shallow or imperceptible. 3. If lips and mouth stained or burned NO EMETICS. Neutralize and dilute acids or alkalis as noted below. 4. Protect internal surface of the stomach and bowels by giving olive, vegetable, or animal oil, milk, white of eggs, strong tea or flour and water. 5. Remove poison from the stomach by emetics, i.e. substances which induce vomiting. *Emetics must only be given when there are no stains or burns on mouth or lips.*

Poisons may be grouped according to their treatment under two headings:

I. Poisons which do not burn or stain the lips or mouth, and in the treatment of which emetic IS to be given, viz.:

1. Narcotics or Hypnotics, i.e. produce sleep, deepening into stupor and finally coma.
   Chief are opium and its preparations, laudanum, paregoric, morphia, chlorodyne, chloral, veronal, medinal, luminal and dial.
2. Deliriants, i.e. substances which produce delirium passing into coma.
   Chief are belladonna, aconite, cocaine and alcohol.
3. Convulsants, i.e. substances which produce convulsions with dyspnœa and lividity. Profound collapse between attacks which may be in rapid succession. Chief are strychnine and prussic acid.

Poisons in these three classes act on the nervous system.

4. Irritants, i.e. substances which irritate the tissues, such as the metallic poisons (arsenic and mercury), rat poison (phosphorus), poisonous plants or seeds, false mushrooms, laburnum seeds, and holly berries.

1. *NARCOTICS.—Chief are—Opium* preparations, i.e. laudanum syrup of poppies, paregoric, and many "soothing syrups," morphia, *chlorodyne*, chloral.

General Treatment: Remove poison from stomach, if possible, by administering an emetic. Then give hot black coffee. Keep patient awake by walking him up and down, flicking him with wet towels, but avoid causing exhaustion. Oxygen and CO_2 inhalation, artificial respiration. Keep warm.

2. *DELIRIANTS* and 3. *CONVULSANTS.—Chief are—*aconite, belladonna (usually sold as liniments), dhatura, cocaine, Indian hemp and alcohol (deliriants) and strychnine (convulsant).

General Treatment: Emetics if conscious, then stimulants. Hot tea and coffee, hot-water bottles, smelling salts.

4. *IRRITANTS.—CHIEF ARE—Arsenic* (rat poison, weed killers, fly papers), phosphorus (rat poison, lucifer matches), tartar emetic, &c., *bad fish*, kerosine, *poisonous plants* or *seeds*, as false mushrooms and laburnum seeds.

General Treatment: Remove poison from stomach by administering an emetic. A tablespoonful of castor oil may then be given. Treat Collapse as under Convulsant. The classification in B.R.C.S. Manual is similar except that Convulsants are included with Deliriants.

CAUTION.—Never give oil or any kind of fat in poisoning by phosphorus (lucifer matches and rat poison).

In this variety of poisoning it is a safe plan to give white of egg, and after a few minutes, an emetic.

II. Poisons which burn or stain the lips and mouth and in the treatment of which NO emetic must be given.

(*a*) *Corrosive Acids*—as nitric (also called aquafortis), hydrochloric (also called muriatic or spirits of salt), sulphuric (also called oil of vitriol), carbolic acid, oxalic acid (also called salts of lemon).

(*b*) *Corrosive Alkalies*—as caustic potash, caustic soda, and strong ammonia.

General Treatment: ACIDS.—Neutralize poison by administering an Alkali as follows:

(*a*) Dissolve a tablespoonful of bicarbonate of soda in a tumblerful of water, and let sufferer constantly sip.

(*b*) If soda is not available scrape lime plaster from ceiling or wall and give in milk. After the Alkali give olive oil and demulcent drink.

Treatment: ALKALIES.—Neutralise poison by administering an Acid, such as frequent sips of vinegar and water, or lemon juice and water equal parts. After this give olive oil and demulcent drinks.

CAUTION.—Never give an Emetic when a Corrosive Poison is suspected.

SPECIAL POISONS AND THEIR TREATMENT

I.—CARBOLIC ACID (PHENOL), AND LYSOL.

Signs and Symptoms: 1. Lips and mouth stained white, smell. 2. Rigors, headache, and delirium. 3. Pupils contracted at first. 4. Skin livid and dry, then clammy. 5. Rapid pulse.

Treatment: 1. Epsom salts half an ounce to pint of milk. 2. Liquid paraffin medicinal half a pint. 3. Olive oil. 4. White of egg. 5. Warmth to body and limbs.

II.—PRUSSIC ACID AND CYANIDE OF POTASSIUM.

Action of poisons extremely rapid.

Signs and Symptoms: (*a*) (*always*).—1. Giddiness, 2. Staggering, 3. Insensibility. 4. Panting respiration. 5. Collapse.

(*b*) (*sometimes*)—6. Convulsions. 7. Smell of bitter almonds.

Treatment: 1. Alcoholic stimulants if able to swallow.
2. Artificial respiration even if breathing has not ceased.
3. Cold water to head and spine.

III.—POISONOUS MEAT, FISH, AND FUNGI.

Signs and Symptoms:—1. Diarrhœa and vomiting. 2. Colic. 3. Cramps in legs. 4. Weakness. 5. Fever. 6. Quick pulse.

Treatment: After emetic, castor oil. Send for doctor or to hospital.

IV.—OPIUM.

Signs and Symptoms: First Stage—1. Thirst, headache, flushed face. 2. Contracted pupils. 3. Pulse strong. 4. Dry, warm skin. 5. Partially unconscious.

Treatment: Give ten grains of permanganate of potash in a pint of water, or have solution ready for doctor.

Second Stage as described in Chart of Insensibility heading "Collapse."

V.—IODINE.

Signs and Symptoms: 1. Lips and chin stained yellow blue. 2. Pain. 3. Vomiting. 4. Bloody stool. 5. Collapse. 6. If starch in stomach, "blue vomit."

Treatment: Give starch and water freely, or thin cornflour or arrowroot.

VI.—ALCOHOLIC POISONING.

1. Large quantity in healthy person may produce excitement, flushed face and dilated pupils. Then vomiting, stupidity and coma.
2. Smaller quantity in ill-nourished may cause "collapse from drink," i.e. drowsiness, deep sleep and collapse. Pulse fast and feeble. Skin cold and clammy.

Send for doctor in both types.

1. Keep patient warm and quiet.
2. Emetic unless very feeble. Hot bottles and hot coffee.

VII.—STRYCHNINE.

Signs and Symptoms: 1. Violent convulsions, arching of back. 2. Lock-jaw. 3. Eyeballs prominent and pupils dilated. 4. Difficulty in breathing. 5. Pulse feeble and rapid.

Treatment: 1. Emetic. 2. Permanganate of potash 10 grs. in pint of water. 3. Strong tea or coffee. 4. Artificial respiration.

VIII.—ARSENIC.

Signs and Symptoms: 1. Vomiting and purging. 2. Pains in calves of legs. 3. Headache and convulsions.

Treatment: 1. Emetics. 2. Milk, brandy and olive oil. 3. Artificial respiration. Have tincture of iron and magnesia powder ready for doctor.

IX.—GASES.

Coal gas, sewer gas, petrol fumes and acetylene (Chart 3). War gases (Chart 2).

Signs and Symptoms: 1. Irritation of throat. 2. Giddiness. 3. Singing in ears. 4. Drowsiness. 5. Coma. 6. Bright complexion.

Treatment: 1. Remove into fresh air. 2. Carbon dioxide and oxygen. 3. Artificial respiration. 4. Keep warm.

X.—BELLADONNA (DEADLY NIGHTSHADE) IN LINIMENTS AND BERRIES, AND ATROPINE (IN EYE DROPS).

Symptoms: 1. Excitement. 2. Skin, lips and mouth dry. 3. Face flushed. 4. Pupils dilated. 5. Delirium and convulsions. 6. Red rash.

Treatment: 1. Emetic. 2. Strong coffee. 3. Artificial respiration if breathing stops.

COLLAPSE.—Collapse accompanies most forms of poisoning, and is treated by (1) placing the patient lying down with head low, (2) warmth (hot bottles and blankets), (3) stimulants (Chart 7).

EMETICS

Following are Emetics best adapted for First Aid purposes:—

(*a*) Two tablespoonfuls of salt in tumblerful (half pint) of warm water.
(*b*) One tablespoonful of mustard stirred in a tumblerful of warm water.
(*c*) Ipecacuanha wine. For an adult, a tablespoonful in half a tumblerful of warm water; for a young child, a teaspoonful in half a wine-glass of warm water. If not effectual, repeat in twenty minutes.
(*d*) Vomiting may also be induced by tickling back of throat with two fingers.

STIMULANTS

Best Stimulants in poisoning are:—1. A teaspoonful of sal volatile in a wine-glassful of water. 2. Hot coffee.

ANTIDOTES

An Antidote is a substance which neutralizes, renders insoluble or destroys a poison, e.g. permanganate of potash for opium and strychnine.

DEMULCENT DRINKS

These are limewater, flour and water, mucilage of gum, white of egg, gelatine, starch solution, ground nut, olive and linseed oils.

COMMONEST POISONS

In the Tropics.—Arsenic, dhatura, bhang, and cocaine.

At Home.—Coal gas, phosphorus (rat poison), carbolic, oxalic and prussic acids, opium preparations (including morphia, laudanum, chlorodyne and paregoric).

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WOUNDS

Injuries of the Body with more or less Division of Skin

General Means of Treatment of all Wounds

1. Place patient sitting or lying down. 2. Elevate bleeding part except fractured. 3. Expose wound. 4. Arrest bleeding. 5. Remove foreign bodies such as glass. 6. Cleanse wound if dirty, avoid contamination by touching wound with dirty hands or washing with water not sterilized. 7. Apply antiseptic 8. Protect wound by pad and bandage. 9. If possible keep wounded parts at rest by application of splint or sling. 10. Do not disturb clot. 11. Do not apply sticking plaster, powders, vaseline, face cream or ointment. 12. Treat shock.

Varieties

1. Incised—clean cuts. 2. Lacerated—jagged tears (hæmorrhage may come on after recovery from shock). 3. Contused—blows of club on scalp may appear clean cut. 4. Punctured—stab (bleeding slight, shock severe). 5. Gunshot—caused by bullets, shot or shell. 6. Poisoned—produced by dirt and microbes from any of preceding five.

Should wound or surrounding part become hot and painful apply boric fomentation.

Abdominal Wounds

Send written message to doctor and keep warm and quiet. (*a*) With protrusion of bowel—1. Wring clean cloth out of weak warm solution of salt and water, keep applied constantly wet and warm as if the abdominal contents become dry and cold they will suffer fatal damage. 2. Bend knees, raise shoulders. (*b*) With no protrusion of bowel—1. If wound vertical, lay flat on back with legs straight. 2. If transverse, raise shoulders, roll up coat, place under knees, and by relaxing muscles bring lips of abdominal wound together.

Stings and Bites are Varieties of Wounds

INSECT STINGS.—Stings may occasion severe symptoms and even death. Symptoms when severe are those of shock accompanied by vomiting, swelling of the face, hands and feet, and delirium.

TREATMENT.

1. Swab with bicarbonate of soda and sal volatile or apply contents of blue bag made into paste.
2. Extract sting by squeezing part or pressing hollow part of stem of small key against it.
3. Treat shock.

SNAKE BITE.—Recognised by two small bleeding points about one inch apart.

TREATMENT.

1. Send written message to doctor. 2. Apply piece of string or narrow bandage tightly round limb or finger between wound and heart to prevent general absorption of snake poison. Apply second bandage above elbow in bites of hand and forearm, above knee in bites of foot and leg. 3. Administer stimulants to counteract heart failure. 4. Allow wounded part to hang down, bathe with warm water to encourage bleeding. 5. Make a cross-shaped cut over bite, rub in crystals of permanganate of potash. 6. Perform artificial respiration if breathing ceases.

BITES OF MAD DOGS.—Keep under observation ten days. If dog dies, generally rabid. Bites of head, face and neck especially dangerous.

TREATMENT.

1. Apply two constrictions round limb as for snake bite.
2. Wash wound with warm water to encourage bleeding.
3. Cauterize with pure carbolic acid or some fluid caustic such as nitric acid. Do not rely on lunar caustic.
4. *Take* to doctor.

TREATMENT OF BURNS

(1) Burns—first and second degrees.

(2) '**Tannafax**' applied—black coagulum formed.

(3) Coagulum removed—healthy new skin revealed.

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BURNS

Produced by dry heat, e.g.—1. Flame, incendiary bombs, or hot iron. 2. Electric cable. 3. Corrosive acid (e.g. vitriol). 4. Corrosive alkali (e.g. quicklime). 5. Friction (brush burn). 6. Blister gases (Chart 2).

Effects.—1. Reddening. 2. Blisters. 3. Charring.

SCALDS

Produced by moist heat, e.g. boiling water, hot oil or tar.

TREATMENT.

1. Remove clothing. If stuck, cut all round burn, soak in bicarbonate of soda solution (tablespoonful to pint of warm water) and allow to come away of own accord. Treat burned as crushed foot by removal of boot, &c.

2. *Do not prick the blisters.*

3. Exclude air by covering with cotton-wool or with lint or linen spread thickly with tannic acid jelly or soaked in tannic acid 2% solution in water; if tannic acid not available, strong tea. When burnt surface extensive, use several small strips instead of large piece as, in subsequent dressings, removal of one piece at a time diminishes shock.

When hand or foot is burnt ease pain by placing in bicarbonate of soda solution, a dessertspoonful to pint, while dressing got ready. If face burnt, cut holes in lint for eyes, mouth and nose, and smear with tannic acid jelly or soak in strong tea.

4. Treat shock. (See Insensibility.) Shock great danger in all burns, especially neck. Sepsis likely. Take great care of slightest burn or scald.

5. Corrosive Acid.—Wash with weak soda and water.

6. Corrosive Alkali.—Brush off lime and apply equal parts water and vinegar.

DRESS ON FIRE

What to do when clothing catches fire.—1. Pick up rug, tablecloth or blanket and hold it between person and yourself. 2. Throw person on floor so that flames are uppermost. 3. Roll burning clothing in rug or blanket until fire quite extinguished.

In the case of Women.—Should your own dress catch fire—1. Lie down as fire ascends. 2. Wrap yourself round in rug, tablecloth, thick curtain or blanket, or failing these, in sound part of dress. 3. On no account rush out of doors, as air feeds flames.

RUPTURE, OR HERNIA

Internal organ (usually bowel) protrudes through wall of belly beneath skin. Common situation just below groin in women, just above in men. Forms soft, rounded swelling which generally disappears on lying down. No symptoms requiring first-aid until nipped in aperture through which it protrudes, then very serious condition.

SYMPTOMS AND SIGNS OF "NIPPED" OR STRANGULATED HERNIA.

1. Sensation by patient of something having given way. 2. Pain may be very acute. 3. Swelling in groin. 4. Relief on bending knee. 5. Sometimes vomiting.

TREATMENT.

1. Send for doctor. 2. Make patient lie down. 3. Raise head and trunk. 4. Bend legs on thigh by pillow under knees. 5. Apply ice or cold water dressing to part.

FROST-BITE

Exposure to severe cold may be followed by chilblain, frost-bite, and gangrene.

CHILBLAIN is local inflammation. FROST-BITE is local anæmia of skin. GANGRENE is local death of part.

SIGNS AND SYMPTOMS.

Affects especially ears, nose, fingers and toes. Owing to loss of sensation often first noted by others.

1. Change in colour (red, white, and then blue). 2. Loss of sensation. 3. Drying and shrivelling.

TREATMENT.

1. Friction by hand. 2. Rubbing with snow and cold water. 3. Remove to shelter, but temperature of shelter must be 60° F. 4. Treat Shock.

FOREIGN BODY IN EYE

Always prevent rubbing. Tie child's hands if necessary.

(*a*) *When beneath lower lid.*—(i) Place thumb below lower lid and pull it downwards, telling the patient to look up; (ii) wet corner of twirled up clean handkerchief and wipe out offending body.

(*b*) *When beneath upper lid.*—Pull upper eyelid forward and downward by grasping lashes between finger and thumb and directing patient to look upwards. Lashes of lower lid sweep inside of upper lid and often remove foreign body. Repeat several times. Patient blowing nose violently may bring particles into visible position. If this device does not remove offending material, take to doctor. If one is not available, proceed as follows. Seat patient facing light, stand behind and steady head against your chest. Place match, toothpick, or similar rod against the lid, grasping lashes and pulling them upwards over rod. Eyelid turns inside out like pocket, and foreign body may be readily removed.

If body embedded in eyeball:—

1. Do not attempt to remove. 2. Drop in one or two drops of castor oil. 3. Apply soft pad and firm bandage to steady eyeball. 4. Take patient to doctor. If quicklime enters eye, bathe with 1 part vinegar or lemon juice to 5 of warm water and treat as above.

FOREIGN BODY IN EAR

1. Never attempt to remove by syringe or hairpin. 2. If earwig or other insect enters ear pour in salad or any vegetable oil and it will float out. 3. If necessary cover ear to avoid poking by child's finger.

FOREIGN BODY IN NOSE

Induce sneezing by pepper or snuff. Make patient blow nose, closing unaffected nostril. If ineffectual take to doctor.

FISH-HOOK IN FINGER

Do not try to draw fish-hook out way it went in. Cut dressing off the hook, leaving only metal, push barbed point through skin and remainder of hook will readily follow. Apply hot boric fomentation.

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AIR RAID FIRST AID

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KINDS OF BANDAGES

Triangular bandages are made by cutting a square of suitable material—linen, calico, &c.—measuring about 40 in. square into two equal parts, thus producing two bandages 40 in. × 40 in. × 56 in.

Roller bandages consist of lengths of suitable material (in various widths according to the purposes for which required). Made from cotton, linen, gauze, stockinette, &c.

Four-tailed and many-tailed bandages have specific uses.

USES OF BANDAGES

1. To retain splints in position.
2. To cover and retain dressings in position.
3. To afford support—as to sprained ankle.
4. To afford pressure—as to reduce swelling; to arrest bleeding.
5. To drive blood from part bandaged—as in collapse.

PRINCIPLES OF BANDAGING

Triangular

1. Apply firmly, but so as not to restrict circulation.
2. Tie knots (reef, not granny) on splints, when possible.
3. Adjust so as to avoid discomfort by pressure.
4. Keep scrupulously clean.
5. Never place on ground for folding or other purposes.
6. Apply bandage which secures upper part of fracture first.

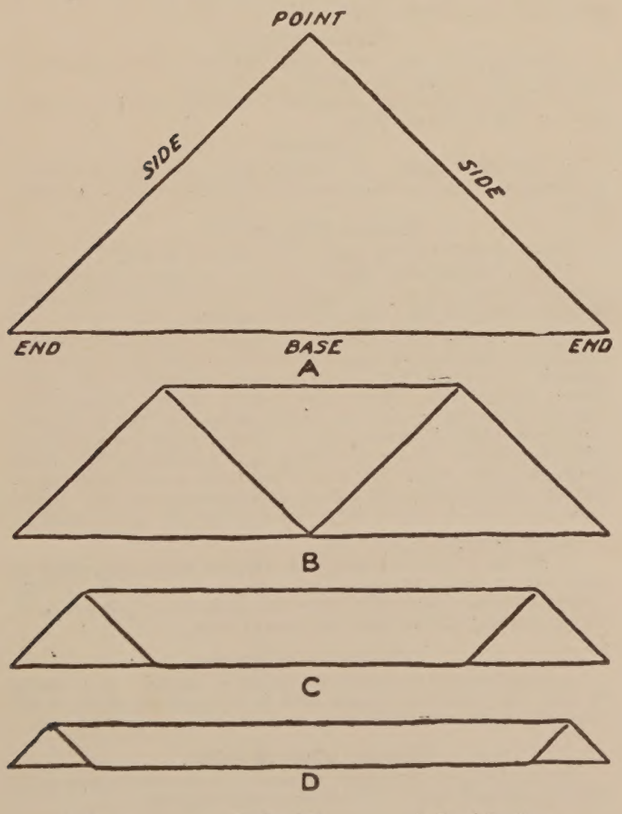
Roller

1. See that bandage is firmly rolled.
2. Stand in front of part to be bandaged.
3. Place part in position in which it is to remain.
4. Lay outside of bandage against skin.
5. Fix bandage.
6. Bandage from within outwards.
7. Bandage from below upwards.
8. Crossings and reverses in straight line.
9. Lower edge of each turn parallel with one above.
10. Each successive turn should overlap preceding one about two-thirds.
11. Always reverse downwards.
12. Never reverse over bony surface.
13. Fasten off bandage securely.

Where pins are required use safeties.

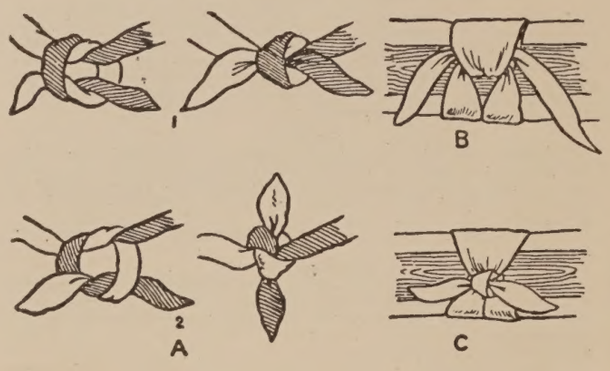
TRIANGULAR BANDAGE

By kind permission of the Executors of the late Dr. J. M. Carvell and the Publishers.

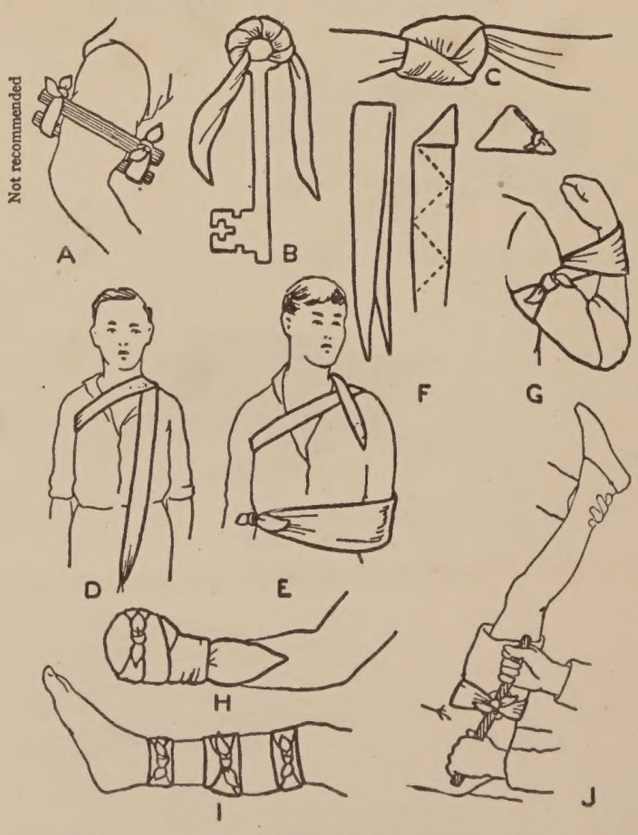


A. Open. B. One fold. C. Broad Bandage. D. Narrow Bandage.

TRIANGULAR BANDAGE



A. (1) Reef Knot. (2) 'Granny' Knot. B. The loop—first stage. C. The loop—finished. D. Large arm sling. E. Small arm sling. F. Improvised arm sling (coat turned up).



A. Stick tourniquet (2 bandages). B. Padded key for subclavian artery. C. Knot for tourniquet. D. Holding pad on subclavian artery. E. Holding pad on axillary artery. F. Pad for axillary artery. G. Brachial artery—flexion. H. Palmar arch. I. Varicose veins. J. Pressure on femoral artery.

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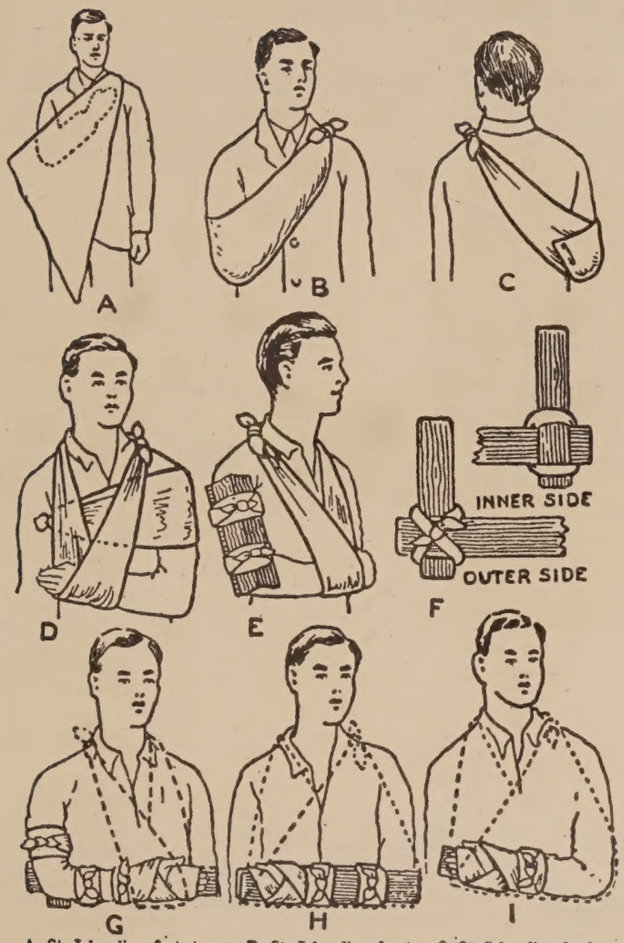
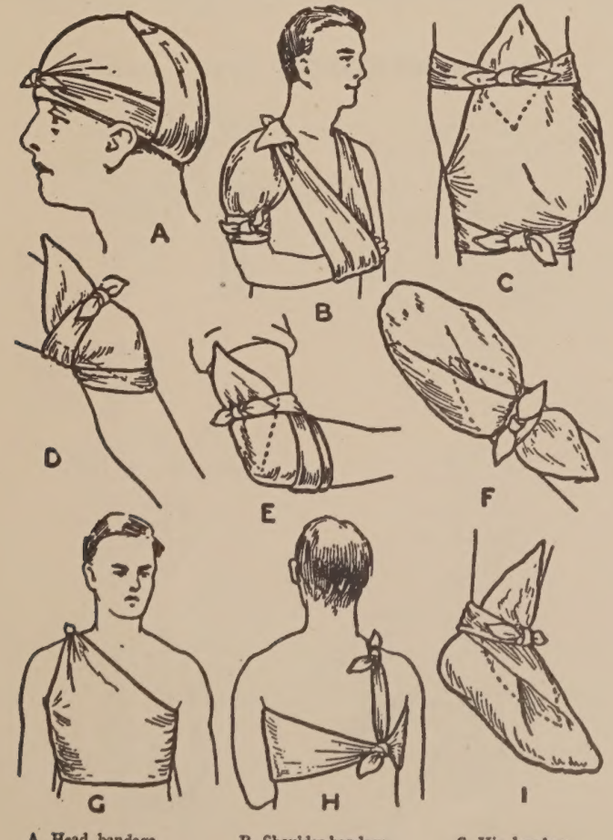
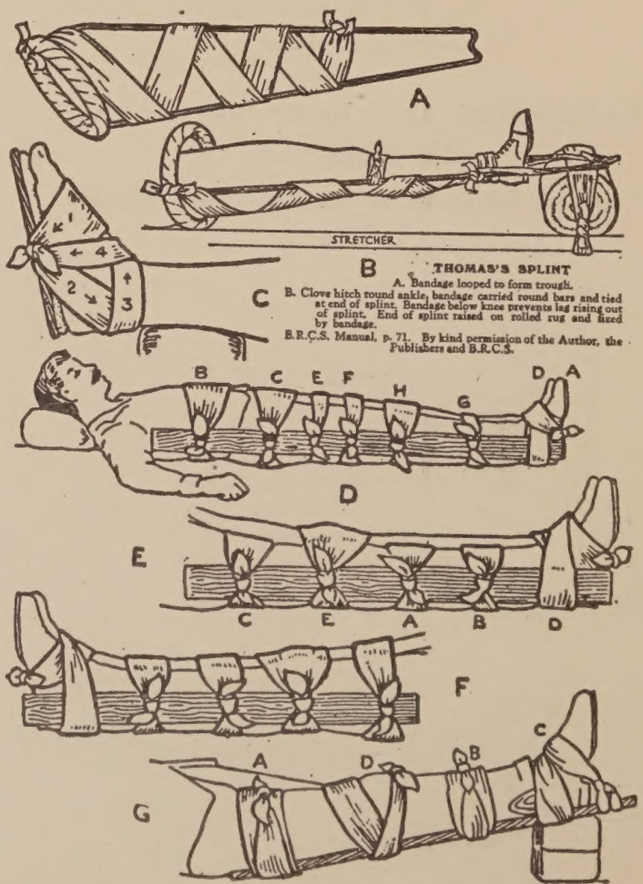


A. St. John sling, first stage. B. St. John sling, front. C. St. John sling, back.
D. Fracture, arm at shoulder. E. Fracture, arm at shaft. F. Angular splint.
G. Fracture, arm at elbow. H. Fracture, forearm. I. Crushed hand.

A. Tr. b. for heel. B. Tr. b. for stump. C. Tr. b. Fracture, lower jaw.
D. & E. 4t. b's. for head. F. Fracture, lower jaw (2 handkerchiefs).
G. Tr. b. Fracture, ribs. H. 4t. b. Fracture, lower jaw.
I. Tr. b. Fracture, shoulder blade.



A. Head bandage. B. Shoulder bandage. C. Hip bandage.
D. Knee bandage. E. Elbow bandage. F. Hand bandage.
G. Chest bandage (front). H. Chest bandage (back). I. Foot bandage.


A
STRETCHER
B
THOMAS'S SPLINT
A. Bandage looped to form trough.
B. Clove hitch round ankle, bandage carried round bars and tied at end of splint. Bandage below knee prevents leg rising out of splint. End of splint raised on rolled rug and fixed by bandage.
B.R.C.S. Manual, p. 71. By kind permission of the Author, the Publishers and B.R.C.S.
C
D
E
F
G

A. and B. Thomas splint. C. Crushed foot. D. Fracture, thigh. [A is fig.-of-8 bandage round ankles and feet; D being placed over A.] E. Fracture, leg.
F. Fracture, leg (single-handed). G. Fracture, knee-cap.

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ROLLER BANDAGING

Designs kindly lent by the Publishers of "The Roller Bandage"

Both triangular and roller bandages are used (1) to retain dressings; (2) to secure splints; (3) to afford support (*e.g.* sprains); (4) to maintain pressure in arresting bleeding and controlling swelling.

Roller bandages have an additional use (5) to drive blood from bandaged part—as in collapse from bleeding.

TEN RULES FOR BANDAGING

(1) Be sure bandage is tightly rolled.

(2) Stand in front of patient except for capeline and place limb in position it is to remain (*e.g.*) elbow bent.

(3) Lay outside of bandage next skin and fix with turn or two to avoid slipping.

(4) Bandage from within outwards and below upwards over front of limb.

(5) Overlap ⅔ of preceding fold with each turn of bandage.

(6) Keep crossings and reverses in straight line and lower edges parallel.

(7) Reverse downwards and never over bony surface.

(8) Maintain firm and equable pressure.

(9) Always form figure-of-8 at joint.

(10) Fasten end of bandage with safety pin or piece of elastic strapping.

FOUR SIZES IN COMMON USE

WAYS OF USING ROLLER BANDAGE

Simple spiral turn (when diameter of part constant).

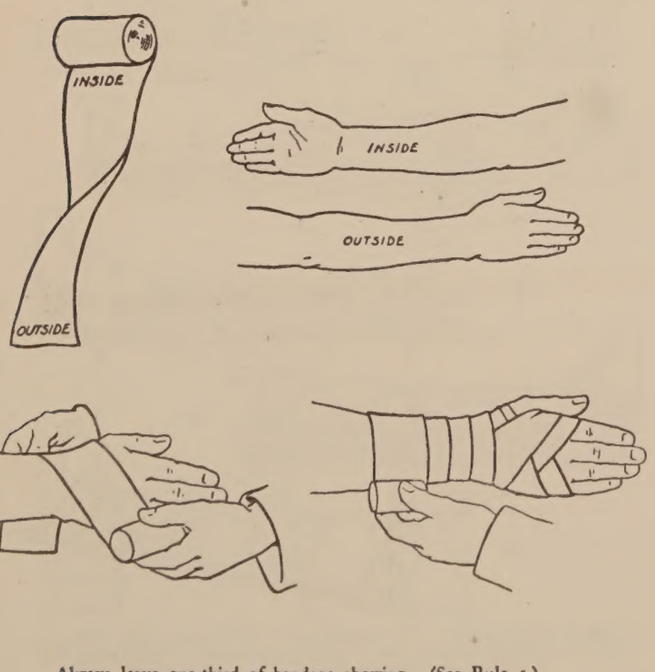
N.B. When removing bandage always gather up as you go along and pass from one hand to the other, until unrolled.

THE REVERSE SPIRAL.
Preparing to reverse after two simple spirals.

The reverse spiral 2nd turn. This turn is used as the limb begins to get thicker, and is also used when there is a great deal of dressing. (Rules 4 and 5.)

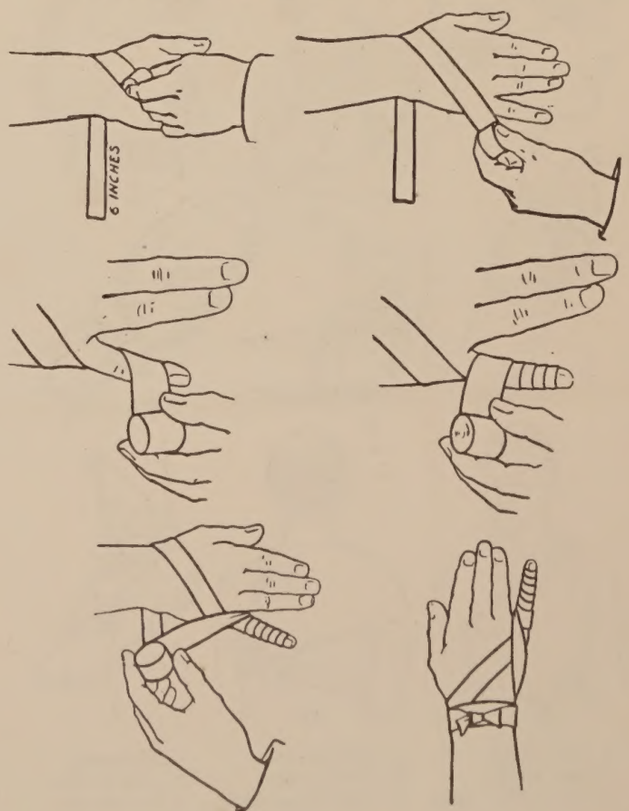
BANDAGING CAN ONLY BE LEARNT BY PRACTICE

DIAGRAMS ARE EASIER TO UNDERSTAND THAN WORDS.



Always leave one-third of bandage showing. (See Rule 5.)

FINGER BANDAGE (⅔ to 1 inch)



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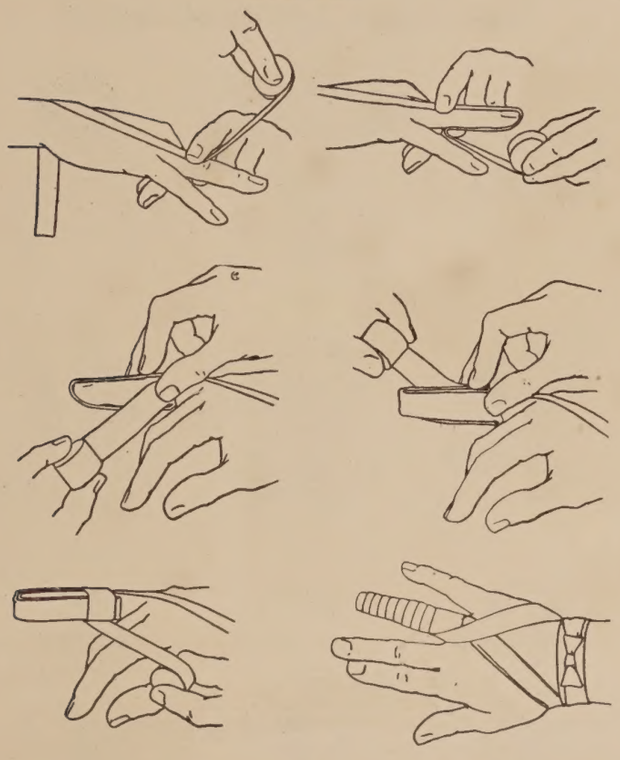
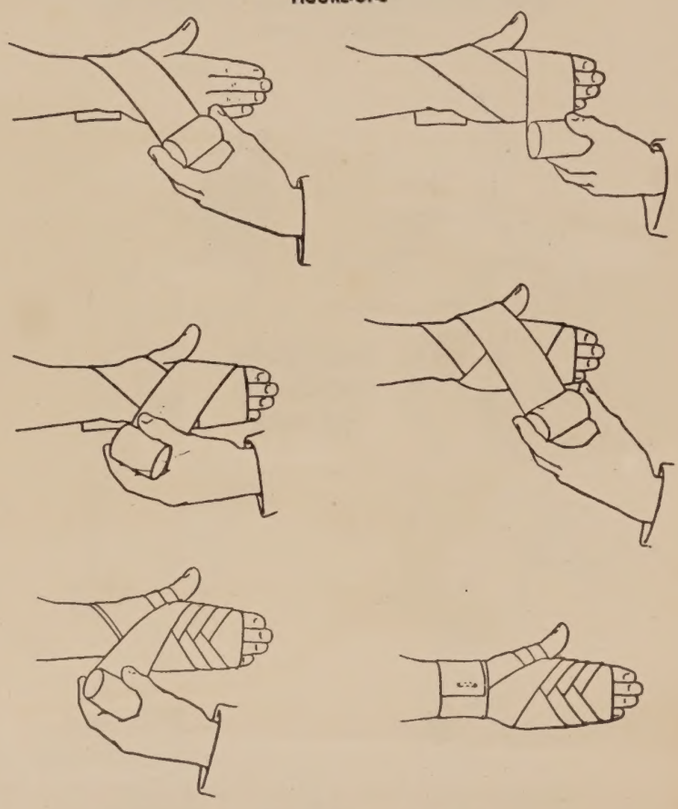
TIP OF FINGER BANDAGE ($\frac{3}{4}$ to 1 inch)

SIMPLE SPIRAL



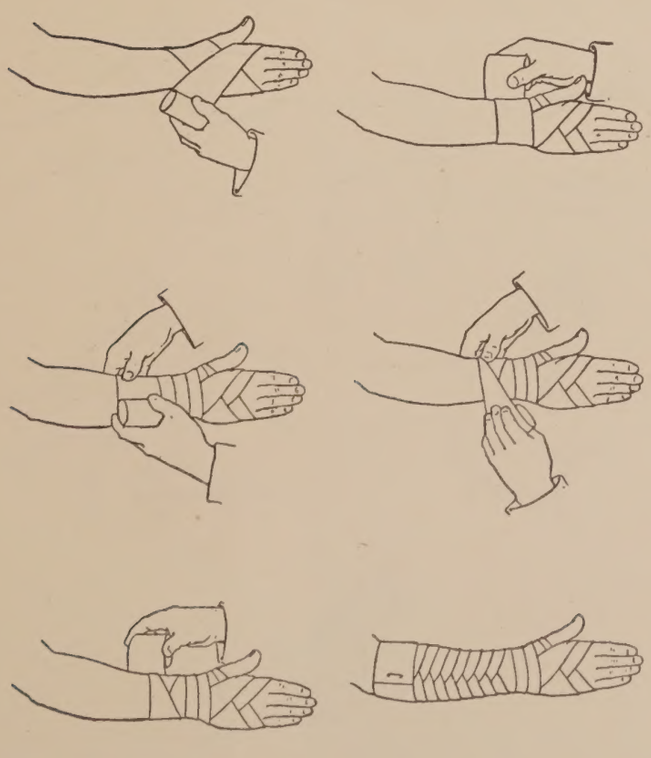
HAND BANDAGE (2 inch or $2\frac{1}{2}$ inch)

FIGURE-OF-8



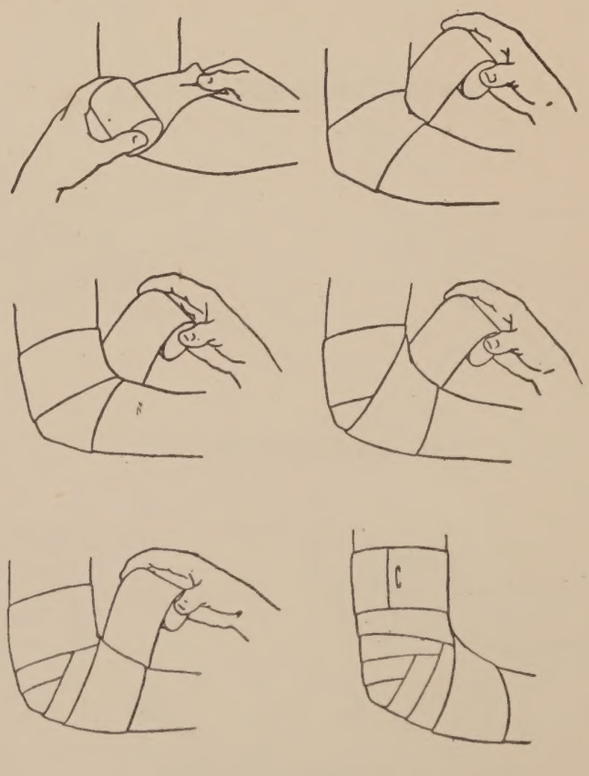
FOREARM BANDAGE (2 inch or $2\frac{1}{2}$ inch)

WITH A FIGURE-OF-8 ROUND HAND TO STRENGTHEN



ELBOW BANDAGE (3 inch) Flex Elbow

FIGURE-OF-8



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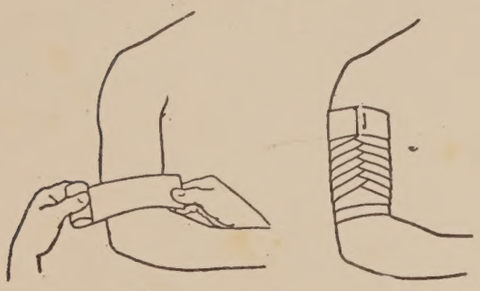
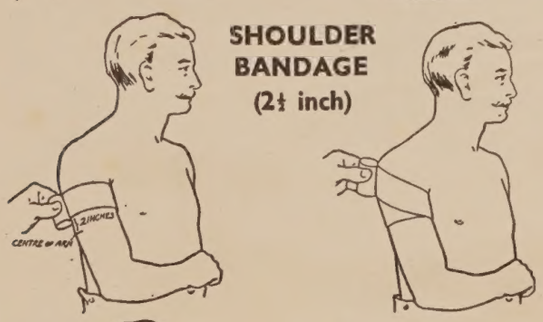
ARM BANDAGE (2 inch or 2½ inch)
REVERSE SPIRAL

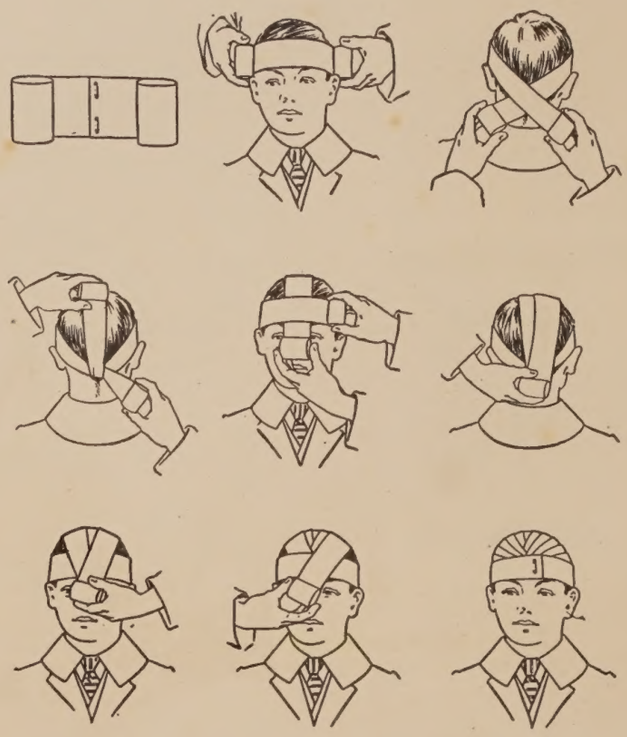


SHOULDER BANDAGE (2½ inch)

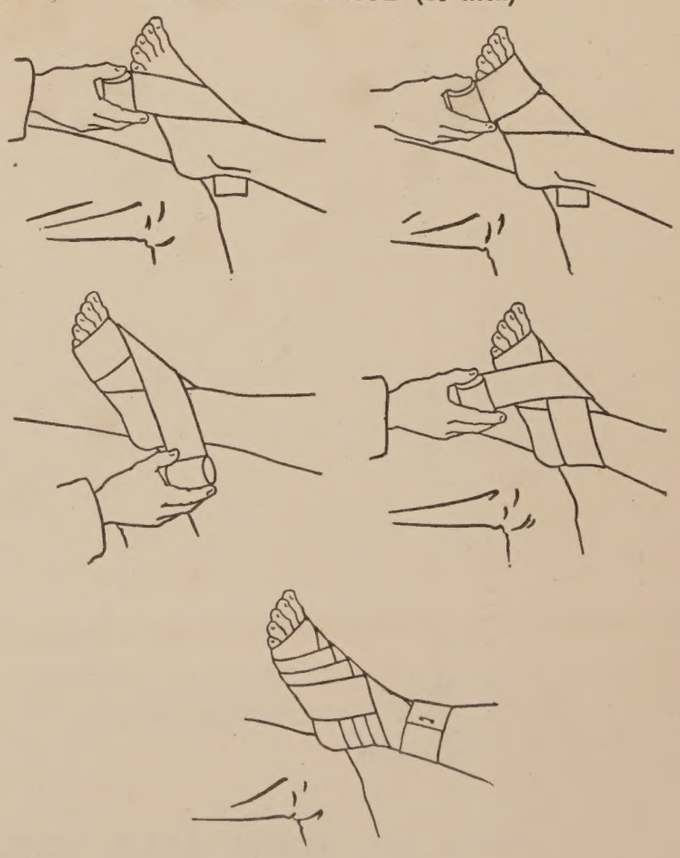


SPICA

CAPELINE BANDAGE FOR HEAD
(Two 2 inch, 6 yards pinned together)



FOOT BANDAGE (2½ inch)



ANKLE BANDAGE (2½ inch)

LEG BANDAGE (2½ inch)

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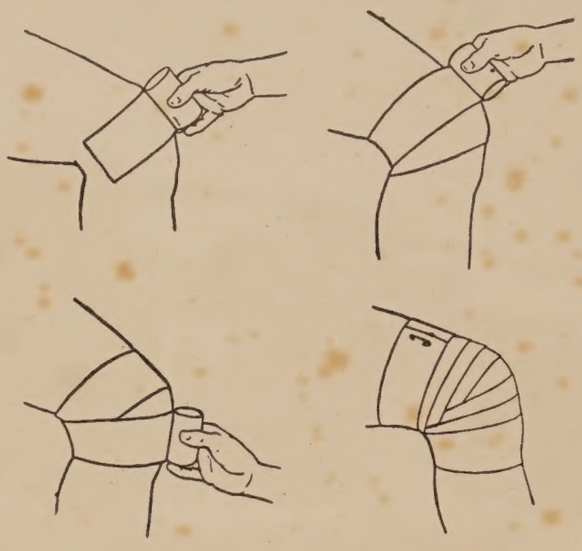
HEEL BANDAGE (2 inch)

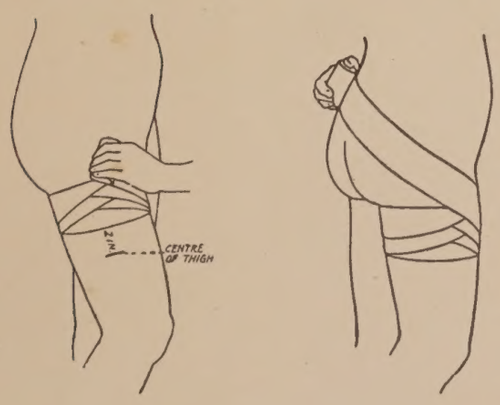
KNEE BANDAGE (3 inch, Flex Knee)

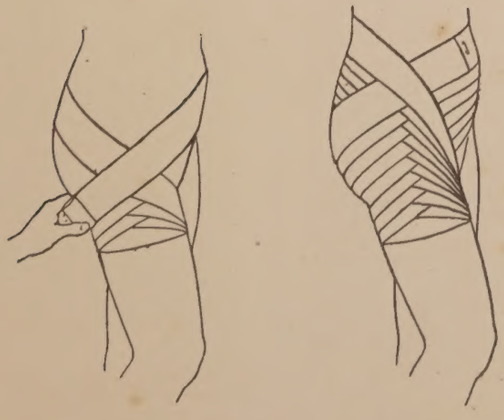


THIGH BANDAGE (3 inch)

N.B.—Always leave nails of fingers and toes visible and watch them. Bluish colour of nails, swelling and/or stiffness of fingers or toes show bandage too tight.

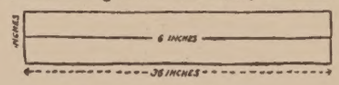
HIP BANDAGE (3 inch)





FOUR-TAILED BANDAGE

To make four-tailed bandage take piece of calico or linen 1 yard long and 6 or 8 inches wide, cut both ends towards the centre leaving 6 inches intact between them.



FOR BACK OF SCALP

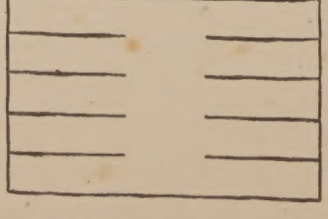
FOR THE FOREHEAD

FOR TOP OF HEAD

FOR CHIN

MANY-TAILED BANDAGE

Take a piece of calico or linen and cut the ends down to the centre as shown.



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